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Feeding Beef Cattle

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By
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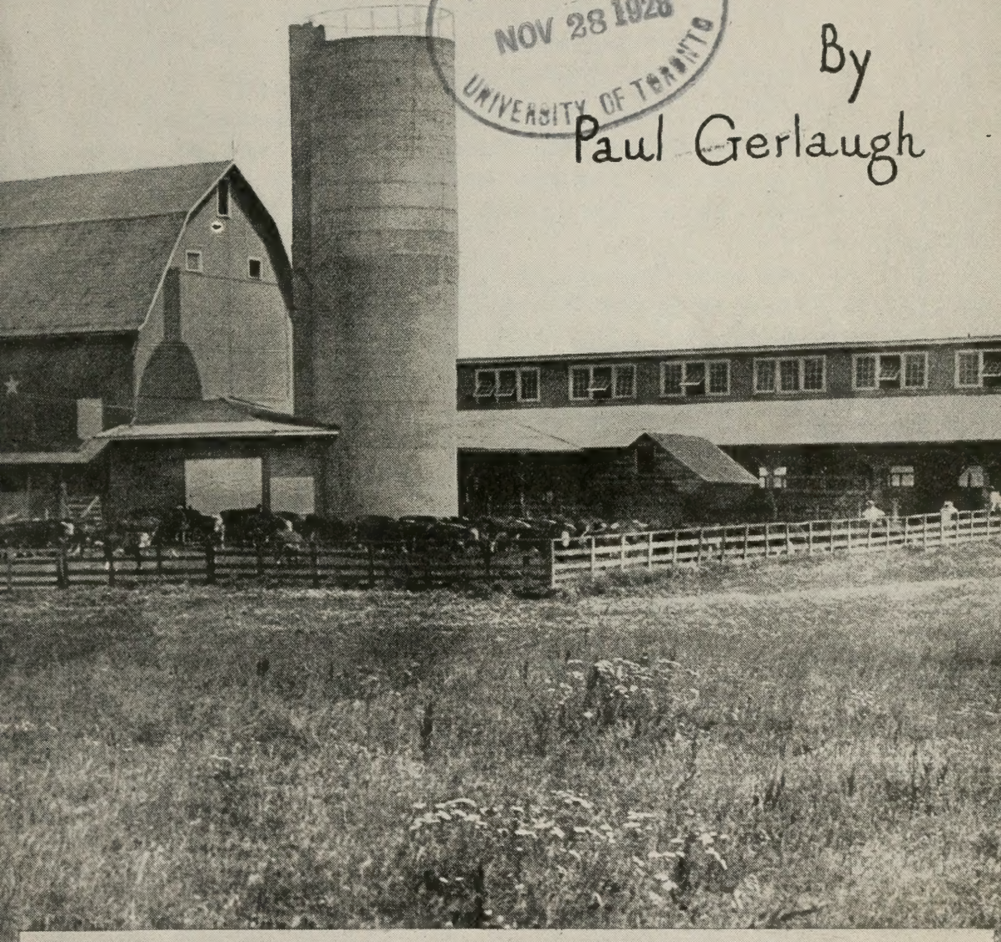

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THE BUSINESS OF FEEDING CATTLE so as to make a profit is one that requires careful study and good management.

The objects in fattening cattle are to utilize the feeds grown on the farm, to keep the soil in a high state of productivity by feeding the crops on the farm and returning the manure to the land, and to increase the farmer's income.

Feeders will find it profitable to develop the cattle feeding business in its relation to their own farm conditions, rather than to attempt to duplicate some neighbor's experience which has proved satisfactory but under entirely different conditions.

An attempt has been made in this bulletin to throw light on some of the bigger problems confronting Ohio cattle feeders. It is realized that many phases of the industry are touched on lightly or omitted.

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FEEDING BEEF CATTLE

By **PAUL GERLAUGH**
Specialist in Animal Husbandry
The Ohio State University

FATTENING CATTLE is an important phase of our livestock industry.

Feeder cattle for the most part originate in the range territory located in the western part of the country. Fattening feeds, of which corn is king, are found in surplus quantities in the central states. The eastern states, with their vast population, do not meet their beef requirements locally, and look westward for much of their beef. Many farmers in the corn belt realize that the demand for beef of a higher quality than can be obtained from range cattle presents an opportunity to market their surplus crops in a more concentrated form, to increase the fertility of their farms, and to make a profit from the business.

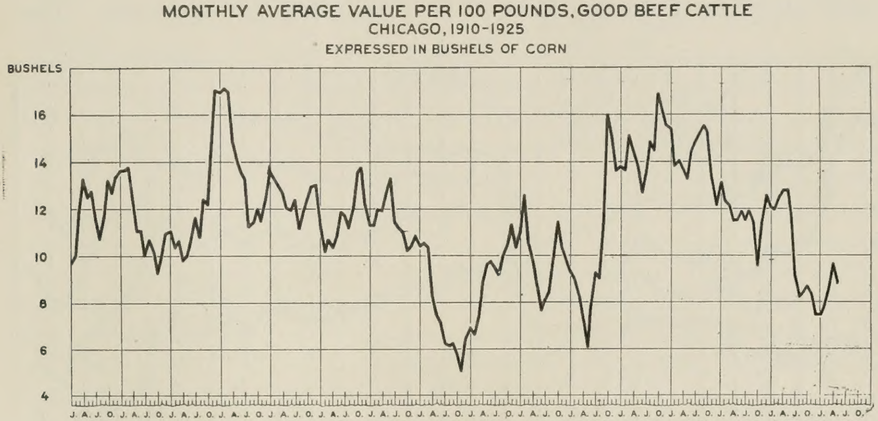


Fig. 1.—The ratio between cattle and corn prices during the 12 years 1910-1921, inclusive, was highest in February, 1913, when the value of good beef steers at Chicago per 100 pounds equaled that of 17.2 bushels of corn. The ratio was lowest in November, 1917, when 100 pounds of live cattle had a value equal to 5 bushels of corn. In general, 10 to 14 bushels of corn have a value equal to 100 pounds of cattle. In 1921 corn was cheap compared with cattle, 100 pounds of cattle equaling about 15 bushels of corn. Note that the scale of the graph has not been carried down to zero.—*Graph by Bureau of Agricultural Economics, U. S. Dept. Agriculture.*

Beef coming from cattle of different classes and grades is demanded. Farms do not grow the same rotations, so that their available feeds, while oftentimes similar, are not identical. Using available feeds in fitting cattle for market, and studying market conditions so that the outcome will be satisfactory, requires thought and a lot of it.

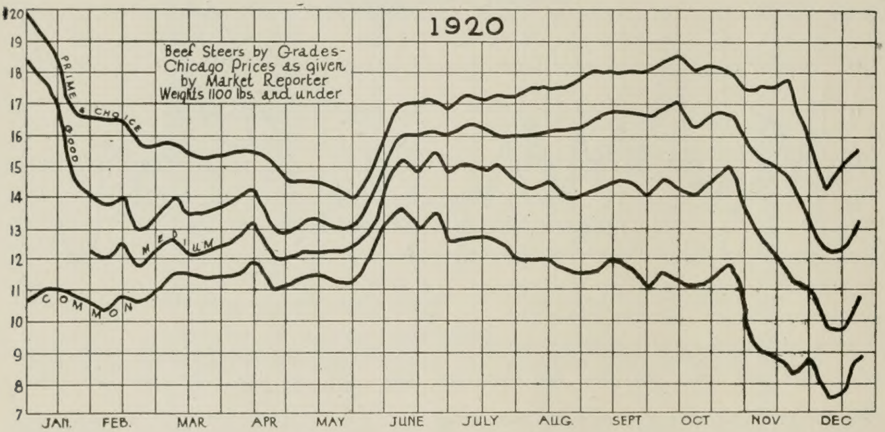
CATTLE PRICES EXPRESSED IN BUSHELS OF CORN

Corn is the chief feed used in this state to fatten cattle. The accompanying graph shows the value of good beef cattle expressed in bushels of corn. There is a wide fluctuation in the relative values but the average is around 12 bushels.

The man who goes into beef cattle feeding should go in expecting to stay. He will in all probability see times when he wishes he were out, but in the long run corn can be marketed through beef cattle to better advantage than to sell it as grain.

SEASONAL FLUCTUATIONS

"Why is it that the market invariably pays a premium for the kind of cattle I do not have?" is a too frequent question. The answer to this question is that the cattle referred to are on the market at a time when more than enough of that grade are available. Scarcity of other grades puts them high compared to the average of the market. There is a seasonal fluctuation on our cattle markets that should not be ignored. Remember that Ohio cattle are not sufficiently numerous to establish market values on any grade.



(See graphs on following page)

The graphs on pages 6 and 7 are worthy of considerable study. They show bi-weekly values of various grades of fat steers on the Chicago market (it is generally agreed that Chicago livestock prices rule the other markets, hence values from that market are used). Prices represent values on steers weighing under 1100 pounds.

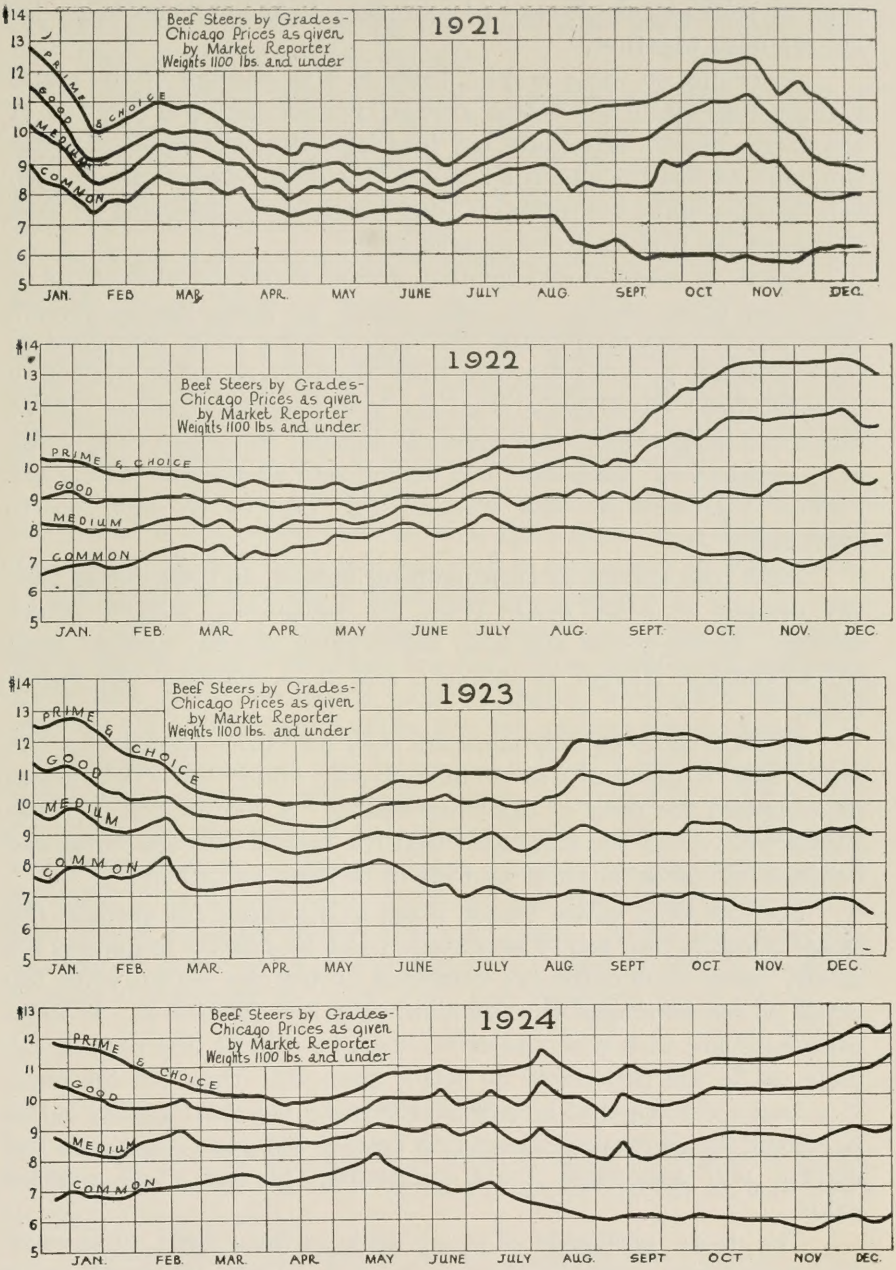


Fig. 2.—Graphs for 1920 to 1924 indicate averages for five years, and show that prices of cattle of different grades rise and fall in fairly well defined cycles.

Each graph represents one year, beginning about January 1 and running to the closing week of December. Prime and choice grades are reported together.

According to these graphs, there is a weakening of the cattle market (especially the better grades) during the early months of the year. In fact, one might say that the better the grade of cattle the more severe the slump up to corn planting season. Many corn belt farmers want the cattle off their farms when labor can be used in connection with the coming corn crop.

Prices of medium and common grades do not parallel prices of good and prime-choice. In fact, prices of these grades remain more nearly level during the first two months when compared to the two upper price curves, and then usually strengthen until May or early June, when cattle from the grass sections arrive. These cattle are supported by the constant demand for cheap beef ordinarily supplied by "grassers" and during late winter and spring are further bolstered by the demand for feeders to turn on to pastures.

With the arrival of corn planting season, and soon after that the coming of grass cattle from the southwest, relative prices change. Prime-choice and good cattle move steadily upward until the Christmas market is supplied, and thus complete the yearly cycle.

Medium cattle usually maintain their own price level during the latter half of the year but common grades slump until the ranges have passed the peak of their marketing. A comparison of these values will justify the statement that the spread between prime and common fat cattle is twice as wide in October as in May.

For the Ohio cattle feeder there is a reward for feeding the grade of cattle that sell to advantage when he expects to market his cattle. Most Ohio cattle are marketed during the season when top cattle do not command the premium they are entitled to. If farm conditions are such that the cattle must be sold at this season, the plain cattle will invariably do better financially than the top ones. If a feeder decides that he will feed nothing but good quality cattle he should by all means endeavor to market his good ones when the market will appreciate them sufficiently to pay their relative value.

The more profitable showing made by these plain cattle when sold during late winter and spring is due to a wider "margin" being obtained than is available on top cattle during the same period. In other words, the plain cattle are bought on a "buyers' market" during October, November, and December when the range offerings are heavy, and are sold during March and April on a "sellers' market" because their numbers are light.

It is sometimes felt by some that the profitableness of feeding plain cattle is a death blow to good blood in beef cattle. This conclusion is false. If a man is raising his own feeders he should have nothing but good blood in his herd. Plain cattle make money because of "margins"—nothing else. Think of the unprofitableness of the production of these plain feeders as compared to the better grades.

Curves showing prices of different grades of fat steers weighing 1100 pounds up have a similar trend. While they do not exactly parallel they run so close to the curves of lighter weight cattle that one set of curves will answer as a guide for both weights. Prices of heifers maintain a steady relationship to steer values.

A safe rule to remember in regard to grades is that plain cattle sell to best advantage between February 1 and June 1, and market toppers and good ones sell high in proportion to the average of the market from June to the Christmas holidays.

A good guide on both weight and quality is that heavy plain cattle sell to good advantage the first three months of the year, plain light cattle the second quarter, choice light cattle the third quarter, and choice heavy cattle the last quarter of the year.

During the fall of the year when a farmer goes to market to buy a load of feeders the feeder salesman will often point to the margin which prevails at that time of year between prime cattle and fancy feeders. Often the fancy feeders are purchased on the strength of such a statement to be fed and marketed during February, March, or April of the following year. In the meantime the market for prime cattle has slumped; the margins which prevailed at time of purchase no longer hold, and disappointment follows.

MARGINS

Margin, or spread, is a term used in cattle feeding to indicate the increase in selling price when the cattle are fat as compared to their cost as feeders.

The amount of margin necessary is dependent upon so many factors that a rule is difficult if not impossible to make. The weight of cattle, length of feeding period, value of feeds, and freight, are all factors affecting the spread. These are explained on next page.

WEIGHT

More margin is necessary on heavy cattle than on light cattle, provided the feeding period is four months or more; especially is this statement true in years of high priced feeds. This is contrary to the opinion of many feeders. It is true that a $2 margin on feeders weighing 1000 pounds means a greater return on original weight than if the cattle weighed 500 pounds at the time of going into the feed lot. However, it costs so much more to put gains on a 1000-pound steer as compared to one weighing 500 pounds that the increased value of original weight due to the margin is more than lost. There will be further discussion of this matter of economy of gains under "Influence of Age."

LENGTH OF FEEDING PERIOD

Long feeding periods require a greater margin than do short ones. It takes more feed to put each succeeding hundred pounds of gain in cattle. Therefore, the gains made late in the fattening period are more expensive and require more margin to cover. There is a further discussion of amounts of feed necessary to put on gains under "Amount of Grain to Produce Gains."

VALUE OF FEEDS FED

When feeds used in the ration are cheap the necessary margin is not so great as when feeds are scarce and high.

FREIGHT

If one thinks in terms of margin as the spread between market prices, then freight and buying and selling charges must be considered.

FEEDING CATTLE ON CONTRACT

Many cattle are fed on contract. Under this method a purchase price and a selling price are agreed upon at time the cattle go into the feed lot. Before entering into a contract to feed cattle there are many items which should be considered. Items which were discussed under "Margin" should receive much consideration.

A definite date should be agreed upon when the cattle are to be "lifted." Provision may be made to feed the cattle for a longer period, but there should also be provision for increased values due to a longer feeding period.

A definite understanding should be had as to who stands the loss by death or injury. This usually falls upon the feeder and should be reckoned with in making the contract. Some contracts call for the party of the first part, the owner, to assume the risk for the first three weeks. This will place the risk where it belongs until the danger from diseases associated with shipping are over, for the most part at least.

It should be remembered that where a definite margin is agreed upon for a given length of feeding period, it is to the advantage of the feeder to have the initial value of the cattle as high as possible. Supposing 800-pound cattle were contracted to be fed 100 days for an advance of $2. Let us assume that the gain would be 200 pounds. If the cattle were valued at $6 per cwt. the initial value would be $48, and with a margin of $2 the final value would be $80, leaving $32 to the feeder per steer. If both initial and final values are increased $2 per cwt., the feeder would have $36 per steer for his increase. This point is apparently better understood by the dealer than by the feeder.

Fig. 3.—From such a choice individual as this heifer calf our beef cattle stocks are improved.

Occasionally cattle are contracted for a definite amount per cwt. of gains. This is a satisfactory method provided the feeder fully realizes the amount of feed necessary to put gains on the weight of cattle considered. Many feeders this past winter fed corn valued at $1.25 a bushel into steers weighing 1000 pounds, and learned that their gains were costing them around $20 per cwt.

Under similar feed prices a man had contracted to feed 800-pound cattle for 150 days during the winter, the gains to be valued at the price of top cattle at Chicago at time cattle were lifted. Such a contract is good for the dealer and disastrous to the feeder. It invariably costs much more to put gains on yearling or 2-year-old cattle than the cattle can be sold for when fat.

FARMERS OR CATTLE FEEDERS

"I never made any money feeding cattle, but I never made any money farming until I started feeding cattle" is a statement which expresses the sentiments of a good many farmers. These men continue in the cattle business because of the increasing fertility of their farms. They are farmers first and cattle feeders second in their order of thinking. Cattle are fed on their farms to consume their surplus corn.

"It is a rare experience with me if my cattle do not make money" is the statement of another group of men. This group is in the minority. The men who make up such a group are cattle feeders first, and grow or purchase corn to feed their cattle.

Both groups of men want to make as much money out of their cattle feeding operations as possible. The men in the first group are wanting to market their 20 to 100 acres of corn so as to get the most money from it. This leads us up to a discussion of profit per steer vs. profit per acre.

PROFIT PER STEER VS. PROFIT PER ACRE

During the winter of 1921-22 the Ohio Agricultural Experiment Station fed several lots of steers. Included in their test were three lots which received rations designed to show the profitableness of a full feed of shelled corn, half a full feed of shelled corn, and no shelled corn, in addition to corn silage, mixed hay, and linseed meal. The results of this experimental work, which extended from December 20, 1921 to April 25, 1922, a period of 126 days, were as follows:

PROFIT PER STEER BASIS

	Lot IV	Lot V	Lot VI
Initial weight per steer	917 lbs.	925 lbs.	924 lbs.
Initial value per cwt.	$7.00	$7.00	$7.00
Average daily ration:			
Corn silage, pounds	21.	37.8	46.
Shelled corn, pounds	13.6	6.8	none
Mixed hay, pounds	1.0	1.0	.9
Linseed meal, pounds	2.5	2.5	2.5
Average daily gain, pounds	2.94	2.86	2.40
*Cost per cwt. gain	$8.63	$7.65	$6.95
Selling value at Wooster (70c. under Pittsburgh values)	$7.95	$7.85	$7.70
Pounds pork to credit of each steer	62.3	34.0	17.4
Profit per steer crediting pork at $10.00 per cwt.	$12.43	$11.99	$10.46

PROFIT PER ACRE BASIS

**Estimated area necessary to grow silage for each steer	.13 acre	.24 acre	.29 acre
Estimated area necessary to grow shelled corn for each steer	.48 acre	.24 acre	none
Total area of corn consumed	.61 acre	.48 acre	.29 acre
Value of beef and pork from feeds fed each steer	$46.27	$40.23	$31.73
Value of hay and linseed meal per ration	9.54	9.54	9.45
Returns of corn and silage fed each steer	36.73	30.69	22.28
Returns of beef and pork per acre	60.21	63.93	76.82
25 acres of corn yielding 64 bu. of shelled corn or 10 tons silage would furnish corn in form of corn and silage as in above ration to	40 steers	52 steers	86 steers
Profits from 25 acres, number of steers fed, multiplied by profit per steer	$497.20	$623.48	$899.56

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*Prices of feeds used were shelled corn 56 cents per bushel, linseed meal $55.00 per ton, corn silage $4.00 per ton, mixed hay $14.00 per ton.

**The estimates are figured on the basis of an acre of corn yielding 64 bushels of shelled corn or 10 tons of silage

If a farmer wants to feed his corn crop so as to get the greatest returns from his corn he will doubtless be interested in the "Profit per Acre" basis of figuring.

The situation can be paralleled to Henry Ford's experience in the automobile business. Doubtless there is more profit per car in manufacturing and selling a single Lincoln than in a Ford. However, the Ford business is the most profitable in a year's time because so many more units are manufactured. The same situation exists in cattle feeding. Too many cattle feeders feel that gain and margin are the two factors that spell successful cattle feeding. Granted, these points are very important, but the cost of gains needs to be considered more seriously.

There are some points in the preceding table that are not applicable in all sections and years. The comparative yields of corn and silage are the results of several crops at the Ohio State University farm. During some years this comparison would fluctuate. However, most Ohio men agree that the comparison is fair.

In some sections, the item of freight on the increased number of cattle and the labor and bedding necessary would be an item of consideration. It should also be remembered that these cattle were sold at a season when high finish does not receive its just due. The Pittsburgh market may not value different grades in the same way as other markets would.

Nevertheless, a farmer interested in marketing so much corn to best advantage through cattle should study both sides. The cattle feeder who buys large quantities of his feeds is not so much concerned, and the feeder who buys all his feeds is interested only in profit per steer.

It is not the purpose of this bulletin to discuss markets and marketing. It is in order, however, to call attention to the development during the past decade of the so-called smaller packing plants and their effect upon cattle feeding and marketing. These smaller plants, together with the development of trucking service, have in all probability reduced shipments of Ohio cattle to terminal markets more than the decrease in numbers fed.

The local market in most cases wants a lighter weight animal carrying less finish than do the terminal markets.

IN THE FEED LOT

The feed lot should be located so as to take into consideration the good of the cattle, the ease of feeding, storage of feeds, and saving of fertility. Often it is advantageous to have the feed lot located with respect to the center of the farm land, rather than its nearness to the residence.

SHEDS

Cattle feeding equipment need not be expensive. A barn with the first floor given over to cattle and hogs, with hay and straw storage above, a crib running along one side, a silo at one end, scales at other end, and south side open, is difficult if not impossible to improve. There is nothing but trouble in the idea that fattening cattle need to be protected in a basement barn that may be tightly closed. Diseases, especially tuberculosis, are more common when cattle are confined in a tight basement.

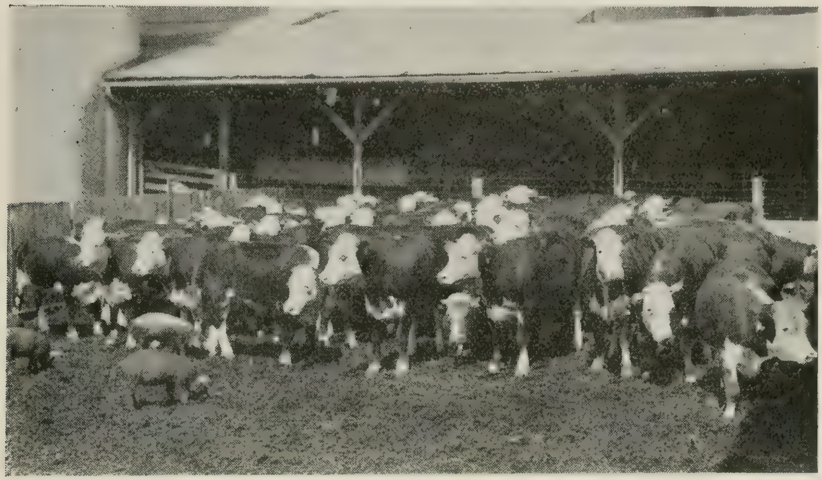

Fig. 4.—Good shelter with ample drainage. This feed lot provides comfortable quarters for fattening cattle. (Note well-constructed eaves trough, and down spout.)

Results of experiments at Pennsylvania State College indicate that gains are more rapid and economical when cattle are quartered in open sheds rather than warm basements. A steer on a full ration generates more than enough heat in the process of digestion to maintain body temperature. Steers need a dry bed with the cold winds broken. A shed open to the south will answer these requirements.

Feed bunks should be constructed so as to economize materials in building, save labor and add to convenience in feeding, and make it possible to elevate the bunk as the height of the manure increases.

Bunks 3 to 5 feet wide inside and 8 to 10 inches deep, and built in units 10 to 12 feet in length, are very satisfactory. These bunks should be built upon 4- by 4-inch posts that rest upon the ground rather than upon posts set into the ground. Bunks of this description can be set in the shed or lot so as to permit the cattle feeding from both sides.

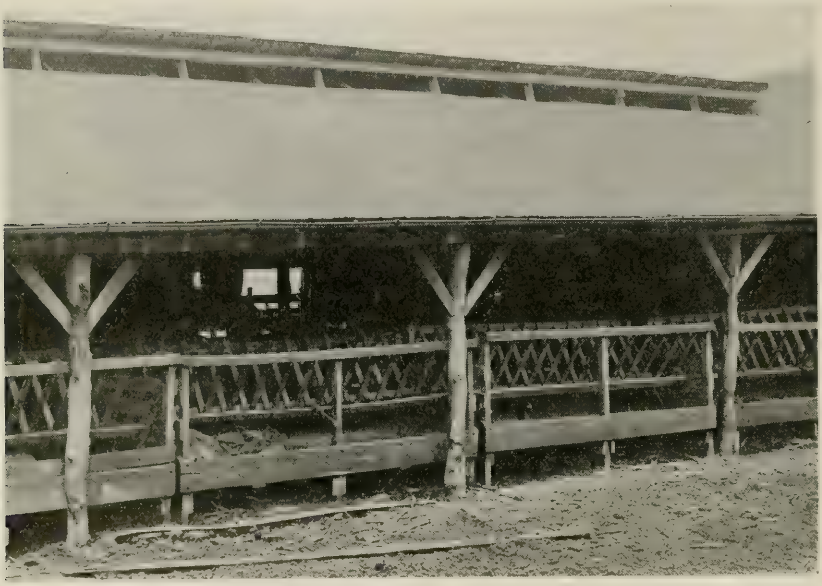

Fig. 5.—Well planned, inexpensive equipment used by Howard Hagler, Fayette County, for feeding shock corn to calves.

If the bunks run to the feed room so as to permit the attendant stepping directly into the bunk with feed carrier or basket, the feeding may be done with ease while the cattle are in the lot.

Bunks around the wall of shed are not economical of space, as the cattle feed from only one side and there is some waste space in the corners. With bunks arranged in this manner they may be supported by chains or lumber from above, and lifted with a little more ease.

If hay is to be fed from the same bunks as the silage and the concentrates, the posts may be extended above the trough 3 feet, and a 2- by 4-inch piece connect them. Slats of 1- by 3-inch material, extending up and down, and placed 3 feet apart, will permit this type of bunk being used for grain, silage, and hay.

A hay rack made of slats placed a foot apart and large enough to hold several days' supply, may be used. The attendant can place a supply of hay near the slats each morning and evening.

RUBBING POLE

A rubbing pole is a worth-while addition to a feed lot. A pole, 3 to 6 inches in diameter, fastened into stirrups on posts, answers the purpose very well. One end of the pole should be about 2 feet from the ground and the other end high enough to permit of the cattle walking under it by bowing their backs.

Wrap most of the pole with feed sacks and saturate with crude oil. This piece of feed lot equipment will add to the comfort of the cattle, as well as materially assist in controlling lice, help to remove warbles at an earlier date, and encourage earlier shedding of hair.

WATER SUPPLY

The water supply should be such as to give cattle access to fresh clean water at will. A cement trough of generous capacity located inside the shed will seldom freeze unless the outside temperature is zero or below. In extremely cold climates smaller tanks filled more frequently will prevent freezing, or a heater may be used.

BEDDING THE LOT

Well-bedded feed lots add much to the attractiveness, convenience, and profitableness of cattle feeding. Many a feeder has expressed a desire for another stack of straw with which to bed his lots. Cattle in a well-bedded lot certainly lead one to think that they are gaining more rapidly than if they were standing in a poorly bedded lot. They lie down, stretch out, grunt and enjoy themselves greatly on a new bed.

Straw and stover are the beddings commonly used. There is little surplus straw in the cattle feeding sections, but usually stover can be located. It can often be purchased to advantage in the form of shock corn or bundle stover. Stover, especially when shredded, makes an excellent bedding for lots that are not well protected from the rain, and in the small lot stover puts in a "bottom" that no other form of bedding can add.

Stover stalks make cleaning the lot more difficult, but this handicap is materially reduced if the lot is small enough so that the manure is well tramped. Cattle in the well-bedded lots look so much better at selling time that they usually command some premium. The saving of fertility due to an abundance of bedding is an item not to be overlooked.

WHICH SEX TO FEED?

While steers are found in most Ohio feed lots, heifers, cows, and occasionally bulls are fattened. Due to the development of the calf feeding industry there has been a marked increase in the number of heifers available for feeding purposes. Heifer calves can usually be purchased for less money and will sell on some markets to as good advantage as steers.

In the feed lot, if there is any difference in fattening ability, it is slightly in favor of the heifer. There is less danger of securing "calfy" heifers when they are purchased as calves than when purchased as yearlings. "Calfy" heifers yield a lower dressing percentage than open ones, and are usually purchased by the packer with this in mind. If heifers can be sold to the butcher or packer and guaranteed to be "open" little discrimination in price should prevail.

One should study markets for heifers, as there is a decided difference in values of fat heifer calves on the various markets available to Ohio feeders. The feeding of cows and bulls is seasonal and one should realize this at time of purchase.

When "she stuff" is fed the feeder should be constantly on the watch for trouble caused by the hogs following. Sometimes hogs will form the habit of nipping the heifers about the vulva and unless the offending hogs are located and removed serious results will follow.

THE QUESTION OF BREED

Most of our larger markets receive cattle of each of the various breeds. There is much difference in the relative number of cattle belonging to certain breeds found at the northern markets as compared to our southwestern markets. Each of the breeds have advantages worthy of consideration.

The question of a preferable breed can best be summed up by stating that "a good one never had a bad color." There is more difference between good and poor individuals within the breed than there is between the good individuals of various breeds.

Horns are objectionable on most cattle in the feed lot because some animals use them to keep other cattle from the feed bunk, and sometimes intentionally strike another animal.

Carcasses from a load of horned cattle usually show more bruises, so that fat cattle buyers prefer dehorned cattle if they have been shipped a long distance. Horned feeders can usually be purchased for less than a similar grade of dehorned ones. However, the question of horns is not so important on calves as on older cattle, notwithstanding the fact that most calf feeders prefer to buy them dehorned.

Fig. 6.—Part of drove of 100 head of Ohio grown steers that averaged 1600 pounds and sold from the feed lot of Thomas Johnson for $19 per cwt., realizing $304 per head.

Dehorning sets cattle back a week or so in their gains. It should be done as soon as possible after the cattle arrive and are rested. Either clippers or a saw may be used. A cord tied tightly around the head just below the horns will prevent the loss of much blood. The work must be done at a season when the flies are not troublesome.

Horned cattle of medium quality can often be "tipped" with as good results as dehorning. This consists of sawing off enough of the horn to expose the core, usually about two inches. This exposure of the sensitive tissues takes the fight out of the cattle about as well as dehorning, and does not retard their gains.

INFLUENCE OF AGE ON ECONOMY OF GAIN

Age has a marked influence upon the economy of gains. Men who have been accustomed to feeding heavy cattle are pleased with the increased gains from a unit of feed when young, light cattle are fed.

Experimental results of a 200-day feeding period conducted at Nebraska in 1922-23, with different ages of cattle coming from the same range so as to have uniformity of breeding, resulted as follows:

	Lot I	Lot II	Lot III	Lot IV
	3 years	2 years	Yearlings	Calves
Number bushels corn fed per steer	80	70	62	46
Total gain for 200-day period	540	516	514	513
Pounds beef made from 1 bushel corn	6.7	7.5	8.3	11.2
Pounds pork to credit each bushel of corn fed to cattle	1.2	1.3	1.1	.89
Combined beef and pork per bushel of corn fed cattle	7.9	8.8	9.4	12.09

There is a wealth of information in the above table. Each calf averaged 513 pounds of gain in 200 days from 46 bushels of corn and .46 ton of alfalfa hay, while the average 3-year-old was making 540 pounds of gain from 80 bushels of corn and .91 ton of alfalfa.

There are several reasons why calves make more pounds of gain from a bushel of corn than do older cattle:

1. They masticate, digest, and assimilate their food more completely, as evidenced by the fact that less pork is produced by the hogs following calves as compared to hogs following older cattle, in proportion to corn eaten by the cattle.

2. Light weight cattle consume more feed in proportion to their size than do heavy cattle, and their maintenance requirement being less than in the case of heavy cattle leaves more feed to be used for gains.

   In the Nebraska test referred to above, the corn consumed by the 3-year-old steers each day was 2 per cent of their weight at the start of the feeding trial. The 2-year-old steers consumed 2.13 per cent of their initial weight daily of corn, the yearlings 2.51 per cent, and the calves 3.27 per cent. This proportional increase in consumption permits more of the ration to be used by the animal in making gains. It is similar in many ways to the statement that a light weight automobile delivers more mileage per gallon of gasoline consumed than a heavy car.

3. Gains of young animals represent more growth than the gains of older animals. Fat represents most of the increase in weight of the older cattle. Tissues of growth such as muscle or lean tissue contain much more moisture than does fat. This fact probably accounts for most of the difference in gains from a given unit of feed.

The Nebraska test referred to shows more spread between ages than some of the tests conducted at Nebraska and other experiment stations. However, the various Stations agree that young animals handle feeds much more efficiently than older stuff. It would be safe to expect this difference to be nearly as great as the test cited under average conditions.

AMOUNT OF GRAIN NECESSARY TO PRODUCE GAINS DURING VARIOUS STAGES OF THE FATTENING PERIOD

The Kansas Station reports the following:

No. Days on Feed	Pounds grain necessary for 100 pounds gain
56	730
84	810
112	845
140	900
168	930
182	1000

These results show that during the first two months of a six-months' fattening period much less grain is necessary to produce gains than during the latter part of the period. As the feeding period advances the cattle usually eat slightly less feed in proportion to their weight, and their gains consist of fat to a greater degree.

A feeder can make more pounds of gain from 50 head of cattle on feed 100 days than he can get on 25 cattle in the feed lot 200 days. Of course there would be more freight and other overhead expenses. This is an important point in those sections located near a market where prime condition is not sufficiently appreciated. Such a practice involving many more cattle can best be handled by men well versed in buying and selling cattle.

FEEDS

Corn forms the backbone of most of our fattening rations. Most cattle are fed in those sections where corn is plentiful. However, corn is not used as extensively in our present-day fattening rations as was the case a few decades ago. Our markets are demanding a greater proportion of lighter-weight cattle. This means younger cattle, and young animals require rations that contain more protein than is needed by older animals. Farms have lost much of their virgin fertility, to keep which requires rotation of crops and using a leguminous crop in the rotation. These leguminous crops should be the chief source of protein in our cattle fattening rations.

Commercial fattening feeds are usually higher priced than home-mixed rations when gains in cattle and hogs are considered.

WAYS OF FEEDING CORN

Corn may be fed to advantage as a green crop commencing any time after the roasting ear stage is reached. When fed in this form it must be remembered that less feed is produced by the corn crop than if the crop matures. To compensate for this lack of nutriment there must be an advantage in buying and selling. These advantages are often present on the good grades of cattle.

There is also a saving of labor if the cattle are turned into the cornfield and permitted to harvest the crop. This is especially advantageous if wind or hail have severely injured the crop and made harvesting more difficult. Cattle like green corn and gain rapidly. It is very palatable due to its higher sugar content, and is easily masticated due to its softness.

The corn crop may be placed in the silo and fed advantageously as silage. An acre of corn will go much farther in the feed lot if fed in the form of silage than if fed in any other way. It requires more labor to handle the corn crop in this way and silos are more expensive than cribs, but if a farmer can manage finance and labor the silo is a great investment for him.

Experiments at the Pennsylvania State College have shown that a ration composed of corn silage and a protein concentrate have given practically as good gains for 140 days as when shelled corn was fed in addition to the silage and protein concentrate. This experience probably cannot be duplicated generally through the corn belt because the silage used in these experiments was made from a crop which in all probability contained a higher proportion of corn than would be the case of corn grown in the darker corn-belt soils.

Silos are especially valuable when the corn crop is planted late, is slow to mature, and when frost threatens or strikes.

It is sometimes stated that silage-fed cattle shrink heavily in transit and have a lower dressing percentage. The degree of fatness and the handling of cattle just prior to shipping influences these points to a much greater extent than the amount of silage fed. There is no evidence to back up the statement that cattle fattened on rations containing silage kill "off color."

Most of our corn is fed as grain. It may be fed unhusked, in the ear, shelled or ground.

Much shock corn is fed in this state. The practice is growing among calf feeders. It is often thought that corn must receive preparation before feeding to calves, but this is not the case. Calves shell the corn from the cob instead of crushing the ears. A variety of corn having a smooth surface of ear and easy shelling qualities is preferred for this purpose.

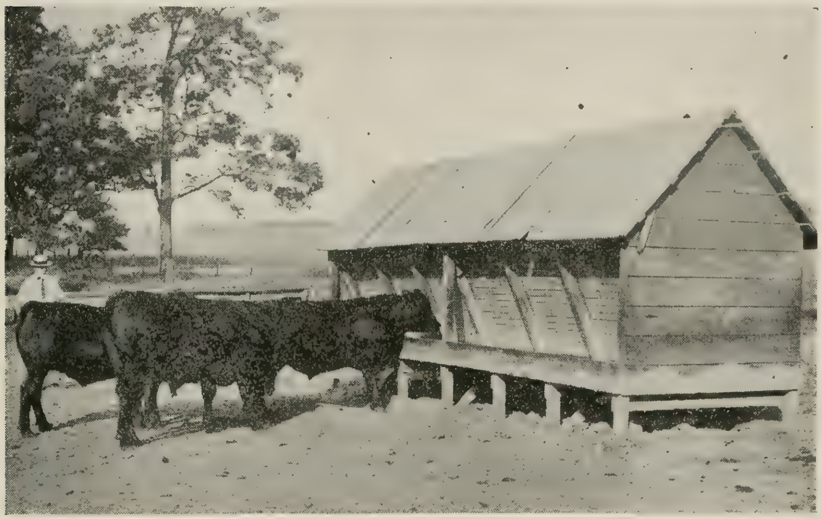

Fig. 7.—This self feeder has enabled A. E. Wildman of Clark County to produce market toppers in a relatively short time.

Whether corn should be fed in the form of ear corn, shelled corn, corn and cob meal, or ground shelled corn depends upon so many factors that no one rule will apply. If there are plenty of hogs to follow the cattle grinding does not pay. Cattle will make more pounds of gain from a bushel of ground corn, either ear or shelled, than from a bushel of unground corn. Gains on hogs following cattle fed on ground corn are correspondingly less so that there is no gain in meat production from the practice of grinding. Cattle will eat more corn when it is ground and will therefore make more rapid gains. This point of faster gains is important when it enables one to reach market ahead of a seasonal break. Corn cobs contain little if any feeding value, and can serve advantageously as a part of the ration only when roughages such as hay, stover, or straw are lacking.

OATS A SATISFACTORY FEED

Oats of good quality make a satisfactory feed for fattening cattle. When ground they are 80 to 85 per cent as efficient as corn for the cattle. There is much less pork produced by hogs following cattle fed on oats as compared to corn. Considering the decrease in pork produced this percentage should be reduced to the basis of 75 to 80 pounds of corn as equivalent to 100 pounds of oats.

HOMINY AS A CORN SUBSTITUTE

Hominy feed is a good corn substitute. It is palatable and if of good quality puts lots of "bloom" on cattle. Compared to shelled corn and considering hogs following the cattle, it is 85 to 90 per cent efficient.

VALUE OF MOLASSES

Feeding molasses is equivalent to shelled corn pound for pound. Five pounds daily is a maximum feed for 2-year-old cattle. Cattle like molasses and eat more feed, hence their gains are more rapid. Some molasses feeds contain up to 35 per cent filler to dry the molasses. These feeds should be purchased on their molasses content.

LEGUMINOUS HAYS

The clovers and alfalfa should be the chief source of protein in most of our cattle rations. Either is very satisfactory. Five to seven pounds of legume hay daily per animal is sufficient to supply the protein requirements for yearling and older cattle.

It is difficult to get calves to consume sufficient hay if silage is used in the ration. It is, therefore, advisable to feed some protein concentrate in addition to legume hay in rations for calves.

Hay made from sweet clover during the fall following seeding is excellent. The quantity is dependent upon the summer rains but the quality is usually comparable to the best of hays. Excessive amounts of sweet clover hay should not be fed. Poisoning of the animal has been produced when moldy sweet clover hay has been fed in large quantities at Minnesota Experiment Station. A few Ohio feeders have had cattle poisoned from feeding large quantities of apparently bright, sweet clover hay. If the hay is moldy, use some other roughage in like amount with it. If the hay is bright it is probably better to use not more than enough of the hay to meet protein requirements.

Soybean hay is palatable and of superior feeding value.

PROTEIN CONCENTRATES

Linseed meal and cottonseed meal are the most extensively used protein concentrates. When used as the only source of protein 2 to 2½ pounds daily per individual will meet the protein requirements of the animal.

Three pounds of hay and 1 to 1½ pounds of protein concentrate make a satisfactory combination for calves.

When 100 bushels of corn will buy 1 ton of protein concentrate the meal may profitably be fed to yearling or older steers in conjunction with legume hay. Here again the market and season must be considered.

A ton of good quality linseed meal is superior to a ton of good quality cottonseed meal for cattle feeding, judging from experimental results. Some feeders fear that a ration composed of linseed meal and silage would prove too laxative. The experience of feeders who have tried the linseed meal seems to indicate that there is no noticeable difference between the protein concentrates so far as this point is concerned.

Calves seem to show a greater return in favor of linseed meal over cottonseed meal than do older cattle. Hogs following cattle fed on linseed meal remain in better health and make more rapid gains than if following cattle fed cottonseed meal as a protein concentrate.

MINERALS

Bohstedt of the Ohio Experiment Station reports that the addition of a mineral mixture to a ration containing alfalfa hay was not profitable when fed to growing and fattening calves. The mineral mixture consisted of equal parts of steamed bone meal, ground limestone, acid phosphate, and salt, and was fed at the rate of 3 per cent of the grain mixture.

Several experiment stations are trying minerals for older cattle, but so far the results do not justify a definite conclusion.

Salt should be available to cattle at all times.

PASTURE

Ohio has a few small areas where cattle can be fattened satisfactorily on grass alone. These areas are located in the southeastern quarter of the state, where the mineral supply of the soil is such that the pastures produce superior grass. These same sections are not well adapted to corn. Values of corn are very high, making its extensive use in rations for fattening cattle a doubtful practice. Most sections of the state cannot compete with the ranges in producing grass beef because of the high price of land.

Many cattle are fattened in the corn-belt section of the state by feeding grain on pasture. When cattle are fattened on bluegrass pasture there is a saving of from 10 to 15 per cent in the amount of grain necessary to put on gains. Feeders should purchase good quality cattle to feed on grass, as they sell at a season when the medium or plainer grades of cattle compete with grassers from the ranges.

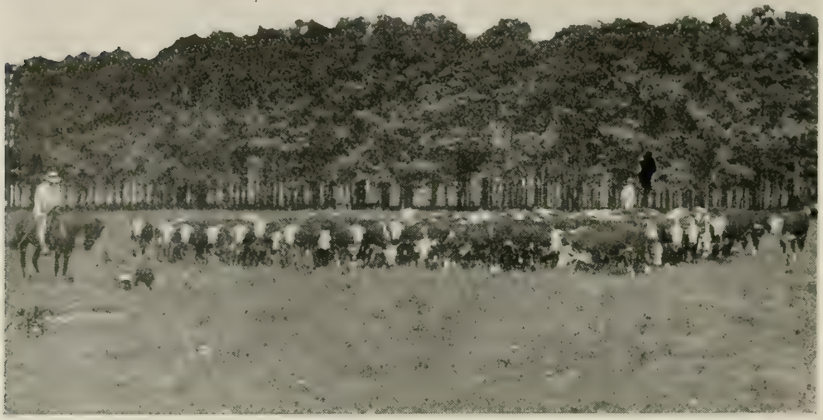

Fig. 8.—The addition of corn to bluegrass pasture has been practised with success in summer feeding on farm of Roy Hagler.

Sweet clover is very popular as a pasture crop in rotation. Its carrying capacity is two to three times that of bluegrass, and cattle thrive when fed grain in connection with this pasture crop.

Shade and fresh water should be available for cattle fattened on pastures. It is advisable to permit the cattle to run into a darkened shed or barn during the daytime. When cattle running on pastures are fed some grain, the droppings of the cattle are worked over by hogs, thus destroying the hatching places of the flies and reducing their numbers.

HOGS FOLLOWING CATTLE

Hogs salvage much feed from the droppings of fattening cattle. The amount depends upon the age of cattle and whether the corn is ground or not.

When cattle are fed unground corn the hogs will salvage enough grain to make 1½ to 2 pounds of gain from each bushel of corn fed the cattle. If the corn is ground the amount of gain produced by the hogs following the cattle is reduced fully one half. When cattle are fed silage one may expect ½ to ¾ pound of gain on the hogs for each bushel of corn in the silage fed the cattle.

There is usually more waste connected with the feeding of shock corn because pieces of ears are often spilled over the edge of the bunk.

PRODUCTION OF FEEDER CATTLE

There is an opportunity for the production of more feeder cattle in southeastern Ohio. Land values are not so high and in most sections enough corn can be produced to carry the herd through the winter on a ration consisting of (1) silage and legume hay, or (2) silage, a pound of protein concentrate daily per animal, and some non-leguminous hay, straw, or stover.

Pastures in many sections of southeastern Ohio should be treated with acid phosphate and lime so as to materially increase the amount and quality of grasses produced, and thus enable a larger herd to be maintained without materially increasing the acreage.

Calves of good quality could be produced and marketed in the fall as feeders, rather than carrying them over the winter and disposing of them the following fall as yearlings. This plan hastens the "turnover" and permits of a larger herd of cows being kept. A feeder calf of good quality will usually return as much money as the plain yearling feeder when marketed in the fall of the year.

This type of cattle production requires good sized herds so as to reduce overhead charges such as labor, bull, etc. For the smaller farm, where the production of cream can be made a good source of income, there are many reasons why the dual purpose or double decker type of cow should be considered.

The average feeder in the corn-belt section can purchase his feeder cattle cheaper than he can raise them. However, there are some men who have maintained breeding herds of beef cows on good land and marketed their calf crop as baby beeves successfully. These men as a rule have good sized herds of hogs which consume much of their concentrate feed, leaving more than the normal amount of roughage for the cattle. The herd of breeding cows is used to consume this large quantity of roughage.

This plan demands quality in the cattle, and pushing the young stuff along for the summer markets. The late Bryon Hawley, who had an enviable reputation as a baby beef producer, used to say "If there is anything better than milk in this business it is more milk." He used good big beef cows that were heavy milkers, and a bull of pronounced beef type.

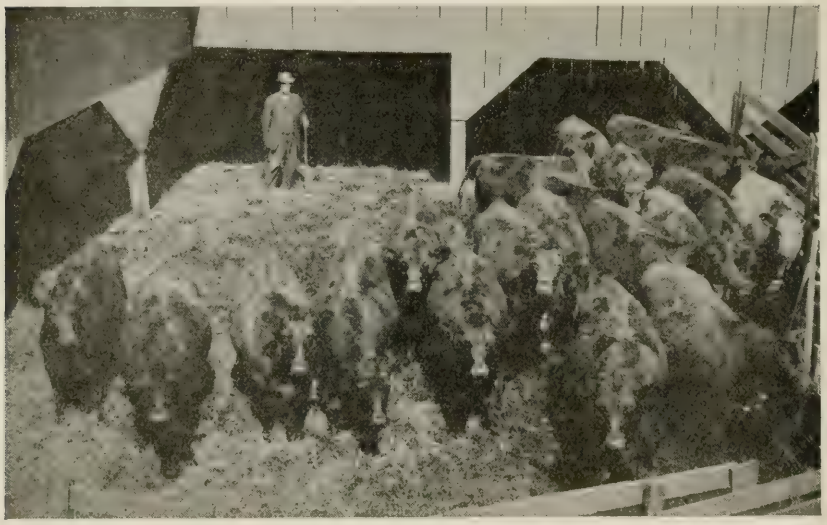

Fig. 9.—Native baby beeves finished at 15 months of age on the farm of the late Byron Hawley.

Usually, when a farmer is good enough to successfully manage a herd under these conditions, he turns his thought to the production of purebreds and sells his surplus for breeding purposes. If he does turn to the production of breeding animals he has the requisites of good beef type in mind so as to make a constructive breed.

LICE

Cattle are commonly infested with lice. Blue lice are found chiefly about the neck and shoulders, while the red lice infest these regions and the root of the tail. Red lice live chiefly upon hair and dead skin, while blue lice suck blood from their host.

Lice may be controlled by using the coal tar dips or crude oil. Dipping or spraying is the common method of applying the dips, while crude oil is applied by hand or so placed that the cattle may apply it themselves.

A rubbing pole as suggested on page 17, wrapped with sacks saturated with crude oil, will permit the cattle to rub their necks and shoulders and assist greatly in controlling lice. Crude oil will destroy the nits as well as the lice.

Spraying with any of the coal tar dips is effective. When spraying, a warm day should be selected and the hair and skin thoroughly soaked.

RINGWORM

Ringworm is a disease of the skin caused by a vegetable parasite. Circular patches 1½ inches in diameter lose the hair and light-colored, scaly crust appears over the spots. These patches are more common on the head and neck, though not confined there. Saturating the crusty patch with iodine will kill the parasite and control the disease.

In a large herd a squeeze chute or scale rack will aid materially in holding cattle while the treatment is applied. Crude oil has proved a very satisfactory treatment for ringworm in some herds of cattle.

INFECTIOUS KERATITIS

This disease is commonly called "pink eye." Sometimes it is found as a transmissible disease spreading to many individuals in the herd and causing much trouble. Little is known of its cause and how it spreads. An animal affected with the disease shows a marked flow of tears, a cloudy swelling appears over the center of the cornea and fades out as it reaches the white of the eye. The animal shows much discomfort. Often both eyes are affected if the disease is in the transmissible form.

The Veterinary College recommends removing the affected individuals to darkened quarters and feed a light laxative ration. The eye should be bathed with a 5 per cent solution of boracic acid and small tufts of cotton saturated with the solution may be placed so that a small portion of the tuft is held in the corner of the eye by the lid. In favorable cases the eyes become clearer within a week or ten days. In unfavorable cases a veterinarian should be consulted.

PANARITIUM (DEW POISON)

Sometimes when rains are very plentiful and the pastures become luxuriant an inflammation develops between the toes of cattle. The affected cattle are observed to limp, and examination shows the skin between and just above the toes to be softened, swelled, showing more color than normal, and sometimes ulcerated.

The Veterinary College recommends driving cattle through a wooden trough containing sufficient amount of a 10 per cent copper sulfate solution to cover the affected parts of the foot as the animal is driven through. Remove the lame animals to dry quarters, if possible.

HOVEN (BLOAT)

When cattle are placed upon a legume pasture they often bloat. Other feeds sometimes cause it. There is a pronounced swelling of the left flank and a distressed appearance. The paunch may become so distended with gas as to prevent breathing and the animal dies from suffocation.

In mild cases, walking the animal or dashing cold water on its side may suffice. A rope passed through the mouth and tied around the head so as to cause the animal to chew upon it may permit the gas to escape.

In severe cases the gas must be permitted to escape by puncturing the rumen. A trocar should be used, though in urgent cases a knife will answer the purpose. Make the incision at a spot on the left, or swollen side, in the center of the triangle formed by the last rib, the hip bone, and the edge of the lumbar vertebrae or loin. Direct the instrument downward, inward, and forward. Observe the animal closely for several hours as the opening may become closed due to swelling.

An ounce of creolin in 2 quarts of water given as a drench will often stop fermentation and formation of gas. Follow with a mild physic.

LAMINITIS (FOUNDER)

Laminitis in cattle is usually caused by overeating, especially at the time cattle are started on a heavy grain ration. Three weeks' time should be allowed to get cattle on full feed. If they are gradually accustomed to grain founder seldom shows up.

In ordinary cases of this disease the animal eats as usual but persists in lying down. The feet are abnormally warm and tender. Give 1 to 1½ pounds of salts as a purgative. If the affected animal can stand in cold mud or a stream the trouble can usually be relieved. Bad cases are difficult to handle and the animal may as well be disposed of as soon as possible for slaughter.

Fig. 10.—These well-bred steers were finished on corn and sweet clover pasture on the Howard Hagler farm.

SHIPPING FEVER

Each year some breeders experience trouble from shipping fever. Whether shipping fever is Hemorrhagic Septicemia or not may be debatable, but there is some infectious disease which sometimes causes heavy losses in feeder cattle soon after their arrival from the stockyards. It seems that the infection is picked up in the stockyards or railway cars. So-called stale cattle are more apt to develop the disease than fresh ones.

Under date of July, 1925, J. R. Mohler, Chief of Bureau of Animal Industry, makes the following statements relative to the results of the Bureau's work in connection with the disease.

"I would suggest that you make it very clear that neither the bacterin nor aggressin treatment has been found to be of much value when applied to animals in the incubative stage of the disease, and, consequently, cattle purchased at public stockyards should be treated as soon as possible after their arrival at such yards.

There is no doubt but that immunity would be established in practically all instances if the animals were treated with either of these agents a week or 10 days before they commence their journey to such yards.

We realize that under the present method of marketing feeder and stocker cattle it is very difficult to convince the farmer who is going to sell the animals that it would be to his interest to have them vaccinated against hemorrhagic septicemia. Therefore, until a treatment can be perfected that will immunize animals more quickly,it seems probable that it will be difficult materially to reduce losses from this disease in feeder and stocker cattle that are purchased and shipped long distances, either direct or through public stockyards."

CONCLUSION

In conclusion, it is a self-evident fact that there is no cut and dried rule to success in cattle feeding.

Buy a grade of feeder cattle that you can give better feed and care than they have been accustomed to. Fit them to your home feeds as much as possible. Loss of one's own labor is very disappointing, but not so serious as needing to meet feed or bank notes when the feeding operation is against you.

Study in advance your selling market if conditions are normal. History repeats itself. Market toppers should be, but unfortunately often are not, the most profitable.

Rations are omitted because relative feed prices fluctuate so much. Let corn, legume hay, and pasture be the chief sources of feed. Put a good, big portion of the corn crop through the silo.

Do not expect the market to go up every day when you are ready to market. Buyers must buy as cheaply as possible, and while markets sometimes seem mighty cruel in the matter of prices, business is business. Establish a good reputation. It is worth while, regardless of the cattle you handle.

"If I chance to talk a little wild, forgive me."

—*Shakespeare, with apologies to the Breeders' Gazette.*